

WHAT IS CLAIMED IS:

1. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel, emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and a radius of curvature from a center of the shadow mask in a major-axis, minor-axis and diagonal-axis direction is substantially same.
2. The cathode ray tube according to claim 1, wherein radii of curvature of the shadow mask are substantially same within the length $H/12$ from the center of the shadow mask, H being a minor-axis direction length of the shadow mask.
3. The cathode ray tube according to claim 1, wherein radii of curvature of the shadow mask are substantially same as a distance from the center of the shadow mask is increased in the major-axis, minor-axis and diagonal-axis directions.
4. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2 + bx^4 + cy^2 +$

$dy^4 + ex^2y^2 + fx^4y^2 + gx^2y^4 + hx^4y^4$, b/a satisfies a condition of $2.2 \times 10^{-6} < b/a < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

5. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2 + bx^4 + cy^2 + dy^4 + ex^2y^2 + fx^4y^2 + gx^2y^4 + hx^4y^4$, d/c satisfies a condition of $2.2 \times 10^{-6} < d/c < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

6. The cathode ray tube according to claim 1, wherein if the shadow mask satisfies a curvature radius expansion expressed by $Z(x, y) = ax^2 + bx^4 + cy^2 + dy^4 + ex^2y^2 + fx^4y^2 + gx^2y^4 + hx^4y^4$, b/a satisfies a condition of $2.2 \times 10^{-6} < b/a < 4.4 \times 10^{-6}$ and d/c satisfies a condition of $2.2 \times 10^{-6} < b/a < 4.4 \times 10^{-6}$, x and y being a distance (mm) from the center of the shadow mask to a point respectively, and Z being a height difference (mm) between the center of the shadow mask and a point on the shadow mask.

7. The cathode ray tube according to claim 1, wherein if the radius of curvature from a center of the shadow mask in a major-axis direction is R_{x0} , the radius of curvature in

a minor-axis direction Ryo, and the radius of curvature in a diagonal-axis direction Rdo, the Ryo has the lowest value among the Rxo, Ryo and Rdo.

8. The cathode ray tube according to claim 1, wherein a thickness of the shadow mask is not greater than 0.1mm.

9. The cathode ray tube according to claim 1, wherein a transmittance at a central portion of the panel is in a range of 45 - 75%.

10. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel, emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and if a radius of curvature from a center of the shadow mask in a major-axis direction is Rxo, a radius of curvature in a minor-axis direction Ryo, and a radius of curvature in a diagonal-axis direction Rdo, the Rxo, Ryo and Rdo are not less than 85% of a maximum value among the Rxo, Ryo and Rdo.

11. The cathode ray tube according to claim 10, wherein the Ryo has the lowest value among the Rxo, Ryo and Rdo.

12. The cathode ray tube according to claim 10, wherein the R_{xo} , R_{yo} and R_{do} are not less than 88% of a maximum value among the R_{xo} , R_{yo} and R_{do} .

13. The cathode ray tube according to claim 12, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

14. The cathode ray tube according to claim 10, wherein the R_{xo} , R_{yo} and R_{do} within the length $H/12$ from the center of the shadow mask are not less than 85% of the maximum value among the R_{xo} , R_{yo} and R_{do} , H being a minor-axis direction length of the shadow mask.

15. The cathode ray tube according to claim 14, wherein the R_{yo} has the lowest value among the R_{xo} , R_{yo} and R_{do} .

16. The cathode ray tube according to claim 10, wherein if the radius of curvature in the major-axis direction from the shadow mask center is R_{xo} , the radius of curvature in the minor-axis direction R_{yo} , the radius of curvature in the diagonal-axis direction R_{do} , a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask R_{xf} , a radius of curvature at the end of the effective surface in the minor-axis direction R_{yf} , and a radius of curvature at the end of the effective surface in the diagonal-axis

direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 44.7% $<Rxf/Rxo <77.6\%$, 59.0% $<Ryf/Ryo <86.1\%$ and 34.6% $<Rdf/Rdo <69.2\%$.

17. The cathode ray tube according to claim 10, wherein if the radius of curvature in the major-axis direction from the shadow mask center is Rxo, the radius of curvature in the minor-axis direction Ryo, the radius of curvature in the diagonal-axis direction Rdo, a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask Rxf, a radius of curvature at the end of the effective surface in the minor-axis direction Ryf, and a radius of curvature at the end of the effective surface in the diagonal-axis direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 62.6% $<Rxf/Rxo <77.6\%$, 74.9% $<Ryf/Ryo <86.1\%$ and 52.1% $<Rdf/Rdo <69.2\%$.

18. The cathode ray tube according to claim 10, wherein a thickness of the shadow mask is not greater than 0.1mm.

19. The cathode ray tube according to claim 10, wherein a transmittance at a central portion of the panel is in a range of 45 – 75%.

20. A cathode ray tube comprising: a panel having a fluorescent formed on an inner surface thereof; a funnel connected to the panel; an electron gun housed in the funnel,

emitting electron beams; a deflection yoke for deflecting the electron beams in horizontal and vertical directions; a shadow mask for selecting colors of the electron beams; and a mask frame for supporting the shadow mask, wherein an outer surface of the panel is substantially flat and an inner surface has a designated curvature, and if a minor-axis direction length of the shadow mask is H , a radius of curvature from a center of the shadow mask in a major-axis direction is R_{x0} , a radius of curvature in a minor-axis direction R_{y0} , and a radius of curvature in a diagonal-axis direction R_{d0} , the R_{x0} , R_{y0} and R_{d0} within the length $H/12$ from the center of the shadow mask satisfy a condition of

$$\frac{\text{Max}(R_{x0}, R_{y0}, R_{d0}) - \text{Min}(R_{x0}, R_{y0}, R_{d0})}{\text{Max}(R_{x0}, R_{y0}, R_{d0})} \leq 0.15.$$

21. The cathode ray tube according to claim 20, wherein if the radius of curvature in the major-axis direction from the shadow mask center is R_{x0} , the radius of curvature in the minor-axis direction R_{y0} , the radius of curvature in the diagonal-axis direction R_{d0} , a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask R_{xf} , a radius of curvature at the end of the effective surface in the minor-axis direction R_{yf} , and a radius of curvature at the end of the effective surface in the diagonal-axis direction R_{df} , at least one of R_{xf}/R_{x0} , R_{yf}/R_{y0} and R_{df}/R_{d0} satisfies conditions of 44.7% $<R_{xf}/R_{x0} < 77.6\%$, 59.0% $<R_{yf}/R_{y0} < 86.1\%$ and 34.6% $<R_{df}/R_{d0} < 69.2\%$.

22. The cathode ray tube according to claim 20, wherein if the radius of curvature in the major-axis direction from the shadow mask center is R_{x0} , the radius of curvature in

the minor-axis direction Ryo, the radius of curvature in the diagonal-axis direction Rdo, a radius of curvature at the end of the effective surface in the major-axis direction of the shadow mask Rxf, a radius of curvature at the end of the effective surface in the minor-axis direction Ryf, and a radius of curvature at the end of the effective surface in the diagonal-axis direction Rdf, at least one of Rxf/Rxo, Ryf/Ryo and Rdf/Rdo satisfies conditions of 62.6% $< Rxf/Rxo < 77.6\%$, 74.9% $< Ryf/Ryo < 86.1\%$ and 52.1% $< Rdf/Rdo < 69.2\%$.

23. The cathode ray tube according to claim 20, wherein the Ryo has the lowest value among the Rxo, Ryo and Rdo.

24. The cathode ray tube according to claim 20, wherein a thickness of the shadow mask is not greater than 0.1mm.

25. The cathode ray tube according to claim 20, wherein a transmittance at a central portion of the panel is in a range of 45 – 75%.